

Ovarian Activity Preceding First Insemination Affects Fertility in Postpartum Dairy Cows

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The high incidence of ovarian abnormalities early postpartum and embryonic losses are recognized problems, yet poorly characterized. To investigate if ovarian activity preceding first breeding postpartum could affect fertility, progesterone (P4) concentrations of 420 Holstein cows were determined through in-line milk analysis system from two herds in Alberta. Data were analyzed to estimate interval from calving to first ovulation (1stOv), number of cycles preceding 1stAI and outcomes (open, pregnant or pregnancy loss). 1stOv occurring ≤ 45 d was defined as Early (Early-Ov) and >45 d as Late (Late-Ov), and cycles were considered as normal (P4 >5 ng/mL for 7 to 19 d) or abnormal (P4 >5 ng/mL for <7 or >19 d). After AI, if P4 reached 5ng/mL (threshold) and remained higher high for more than 40 d, it was considered pregnancy. If P4 dropped below threshold between 20 to 40 d, pregnancy loss was considered. Overall, 33.4 and 26.2% cows were pregnant, and 13.7 and 12.4% had pregnancy loss after 1st and 2ndAI, respectively. 1stOv occurred later in primiparous cows than in multiparous cows (51 vs 47 d, $p<0.01$). Although, primiparous cows were 1.7 times more likely to conceive to 1stAI ($p<0.05$), they were 1.7 times less likely to conceive after 2ndAI compared to multiparous cows ($p=0.05$). Early-Ov cows were twice more likely to become pregnant to 1stAI than Late-Ov ($p<0.01$). Pregnant cows (and cows that had pregnancy loss) had earlier 1stOv (38.7 d) than open cows (45.6 d, $p<0.01$) and had more normal and total cycles before 1stAI than open cows (1.16 and 1.67 vs 0.87 and 1.43, respectively; $p<0.05$). However, the prevalence of abnormal cycles preceding 1stAI was not different between cows that remained open, became pregnant or that lost pregnancy.

Take Home Message: Cows ovulating earlier postpartum, had a greater chance of conceiving to 1stAI. However, primiparous cows were more fertile than multiparous cows even though they had a longer interval from calving to 1stOv. Cows that conceived to 1stAI had more ovarian activity preceding that AI than cows that did not conceive. Ovarian activity preceding 1st AI did not differ between cows that successfully maintained the pregnancy and cows that underwent pregnancy loss.